CLAIMS

We claim as our invention:

1. Apparatus comprising:

an input device which accepts user input;

a cover;

a hinge which connects the input device to the cover so that the input device and the cover are openable and closeable by rotation about a predetermined rotation axis, wherein the cover covers at least part of the input device while in a closed position;

a restraint which maintains frictional resistance between the input device and the cover to maintain an angle between the cover and the input device;

an operation detector which is coupled to said restraint and which accepts a reduction instruction provided by a user to reduce the frictional resistance; and

a friction controller which is coupled to said restraint and which reduces the frictional resistance in said hinge when the reduction instruction is accepted.

2. Apparatus of Claim 1 wherein said cover has an output device which outputs user information, and said restraint maintains the frictional resistance to maintain the angle.

3. Apparatus of Claim 1 wherein said operation detector draws power from a first power supply which is other than a power supply used for the operation of a processing unit.

4. Apparatus of Claim 1, further comprising:

a first switch provided on one of said input device and said cover; and

a second switch provided on the other of said input device and said cover;

wherein said operation detector accepts the reduction instruction by accepting an instruction from each of said first switch and said second switch, and

wherein said friction controller reduces the frictional resistance in the restraint in response to the instruction from each of said first switch and said second switch is accepted.

5. Apparatus of Claim 1 wherein said restraint further includes:

a shaft fixed to one of said input device and said cover; and

a coiled spring made of a shape-memory alloy and having its opposite ends fixed to the other of said input device and said cover and coiled around said shaft to hold said shaft by the frictional resistance at ordinary temperature;

wherein said friction controller increases the length of said coiled spring relative to the length at the ordinary temperature by setting said coiled spring at a shape recovery temperature to reduce the frictional resistance when said operation detector accepts the reduction instruction.

6. Apparatus of Claim 5 wherein a helical groove is formed in a surface of said shaft, and said coiled spring is coiled around said shaft along said groove to maintain said shaft by the frictional resistance.

7. Apparatus of Claim 5 wherein a material forming a surface portion of said shaft has a friction coefficient larger than that of a material forming an inner portion of said shaft.

8. Apparatus of Claim 1 wherein said restraint maintains the angle by the frictional resistance which prevents the angle from being changed by the weight of said input device and said the cover in a state where said input device is horizontally positioned.

9. Apparatus of Claim 8 wherein said restraint maintains the angle by applying a frictional resistance which is smaller than a user supplied torque for changing the angle.

10. Apparatus of Claim 1, further comprising:

a torque release which allows for the rotation release of said cover relative to said input device in response to a torque externally applied between said cover and said input device if the externally applied torque is larger than a predetermined magnitude.

11. Apparatus of Claim 10 wherein said restraint further comprises:

a shaft provided between said input device and said cover; and

a coiled spring made of a shape-memory alloy, provided on one of said cover and said input device, and coiled around said shaft to hold said shaft by the frictional resistance at ordinary temperature;

wherein said torque release mechanism is provided on the other of said cover and said input device to hold said shaft by a predetermined torque.

12. Apparatus of Claim 1, further comprising:

a user authentication circuit coupled to said restraint which authenticates a user;

wherein said restraint maintains the angle by applying a frictional resistance which is larger than a user supplied torque which changes the angle in a state where said input device and said cover are closed; and

wherein said restraint reduces the frictional resistance to a value smaller than a user supplied torque which changes the angle in a state where said input device and said cover are closed if the authenticity of the user is confirmed.

13. A rotation control device which connects a first part and a second part so that the first part and the second part are openable and closeable, and which controls the rotation of the second part on a shaft connected to the first part, said rotation control device comprising a coiled spring which has its opposite ends connected to the second part, which is wrapped around the shaft at an ordinary temperature to hold the shaft by a predetermined frictional resistance, which increases in length from its length at the ordinary temperature to reduce the frictional resistance when set at a shape recovery temperature different from the ordinary temperature, and which is made of a shape-memory alloy.

14. Apparatus comprising:

a hinge which connects a first part to a second part so that the first part and the second part are openable and closeable by rotation about a predetermined rotation axis;

a coiled spring which has its opposite ends connected to the second part, and which is made of a shape-memory alloy; and

a bearing part which is connected to the first part, and which holds the periphery of said coiled spring at an ordinary temperature by a predetermined frictional resistance;

wherein said coiled spring is reduced in length from its length at the ordinary temperature by being set at a shape recovery temperature different from the ordinary temperature to reduce the frictional resistance.

15. A method comprising:

generating a first electrical signal which affects the flow of current through a shape-memory-alloy wire which surrounds a shaft which couples a first and second portion of a device, wherein the first electrical signal causes the shape-memory-alloy wire to have a first length which tends to grasp the shaft and produce a predetermined rotational friction between the first and second portions;

accepting a second signal;

generating a third electrical signal which affects the flow of current through the shape-memory-alloy wire, wherein the third electrical signal causes the shape-memory-alloy wire to have a second length which tends to release the shaft and produce a second predetermined rotational friction which is lower than the first predetermined rotational friction, wherein the third electrical signal is generated in response to accepting the second signal.